April 20, 1937. C. W. GESKE ET AL 2,078,073

REFRIGERATOR DOOR LATCH

Filed May 25, 1936 2 Sheets-Sheet 1

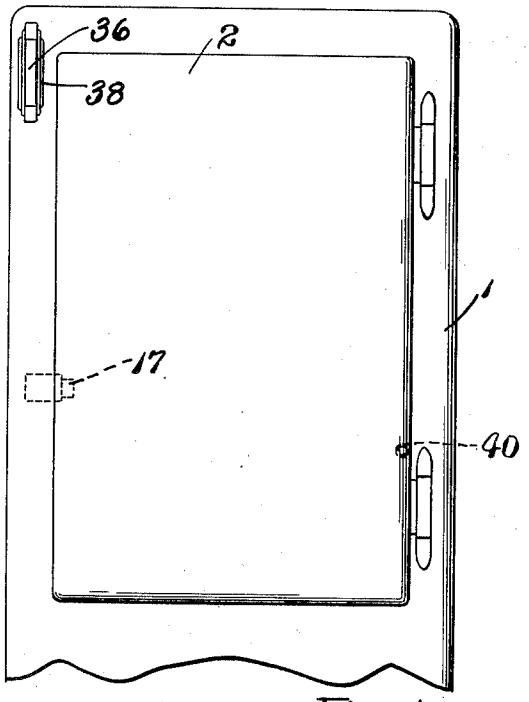


Fig. 1.

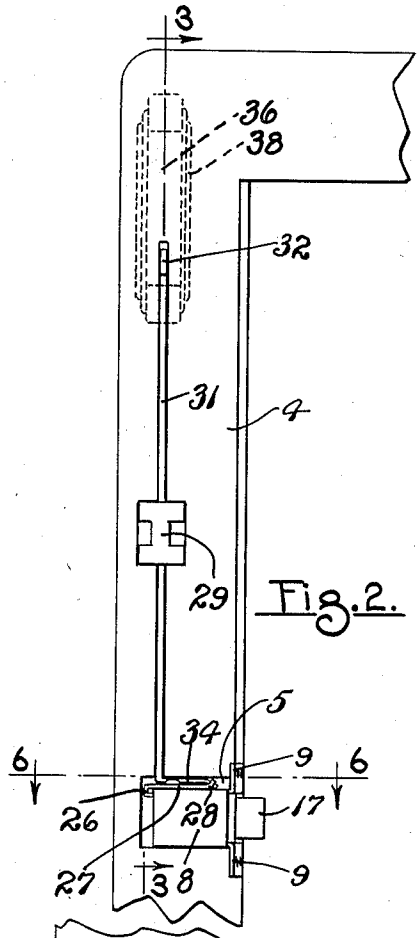


Fig. 2.

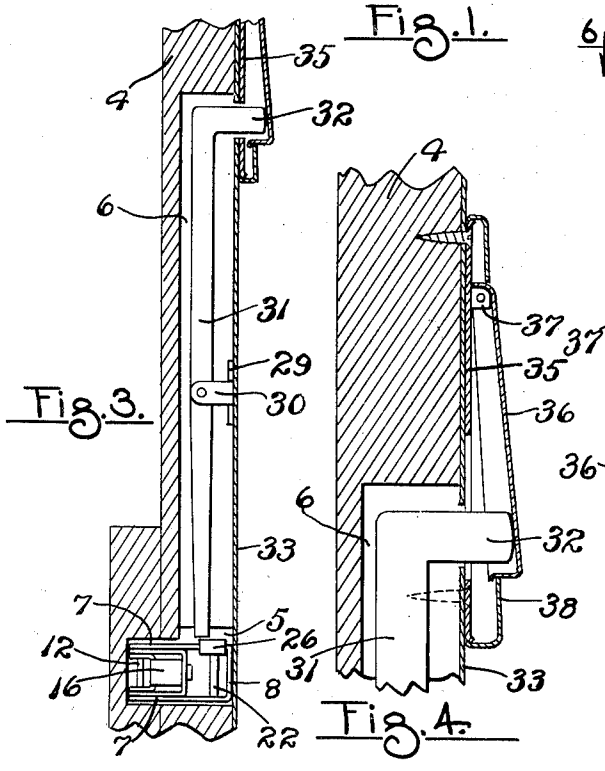


Fig. 3.

Fig. 4.

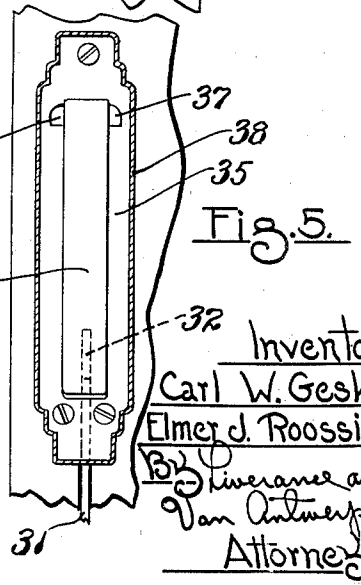


Fig. 5.

Inventor
Carl W. Geske
Elmer J. Roossien
By Livingston and Van Antwerp
Attorneys

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REFRIGERATOR DOOR LATCH

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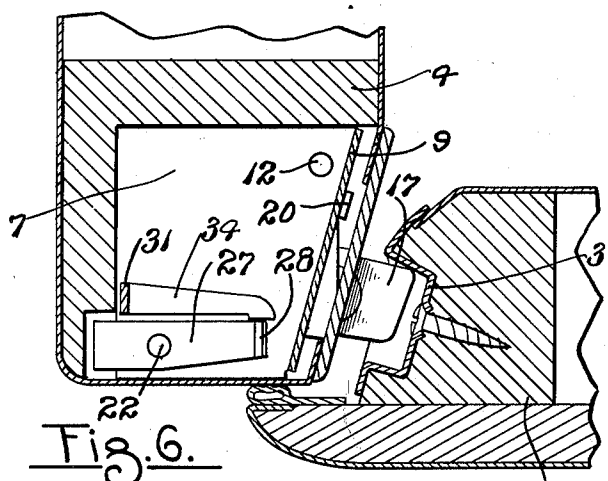


Fig. 6.

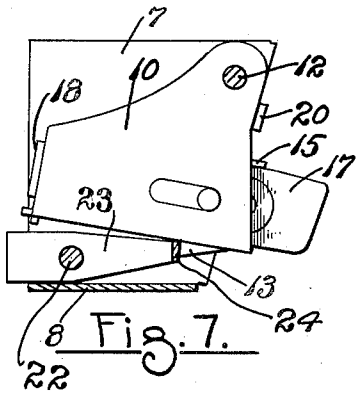


Fig. 7.

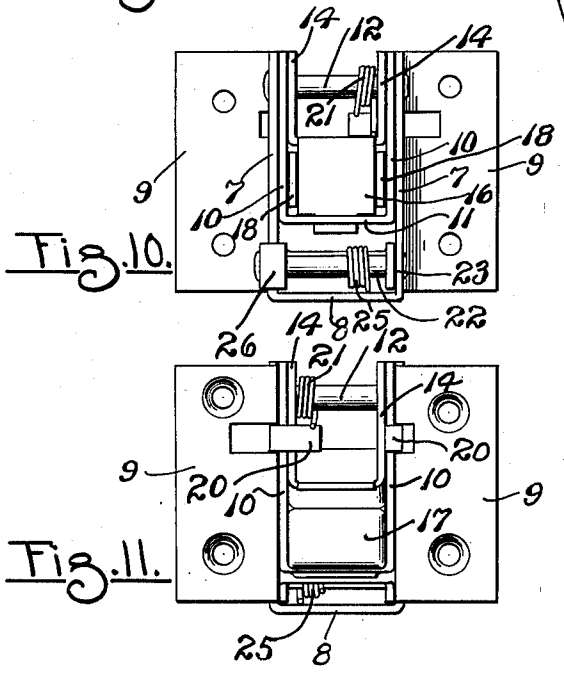


Fig. 10.

Fig. 11.

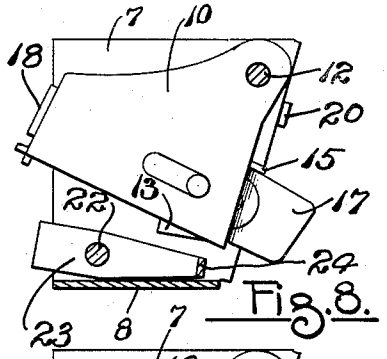


Fig. 8.

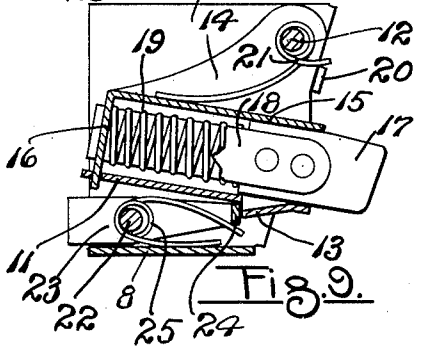


Fig. 9.

Inventors
Carl W. Geske
Elmer J. Roossien
By Lawrence and Van Antwerp
Attorneys

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REFRIGERATOR DOOR LATCH

Carl W. Geske and Elmer J. Roossien, Grand Rapids, Mich., assignors to Winters & Crampton Corporation, Grandville, Mich., a corporation of Michigan

Application May 25, 1936, Serial No. 81,661

10 Claims. (Cl. 292—63)

This invention relates to latches and more particularly to latches which are adapted for refrigerator use. However, the latch is in no sense restricted to use on refrigerators alone, but may be used in many other relations where a swinging door mounted upon a suitable door frame is to be latched in closed position and released from such position for opening.

It is a primary object and purpose of the present invention to provide a novel structure of latch mechanism which is very economical to produce and very simple in installation, and one wherein a door may be moved to closed position whereupon the latch will automatically engage with the door and hold it snugly in such position, but upon a light pressure being applied to a releasing member mounted upon the door frame or casing, which releasing member is moved but a very short distance, the latch as a whole turns about an axis upon the door swinging open, the door preferably being automatically swung open by any suitable means acting for such purpose. It is, of course, to be understood that the positions of the latch and its keeper may be reversed, that is, mounting the latch upon the door and the keeper upon the door frame, without departing in any respect from our invention. A still further object of the invention is to mount a latch upon the door frame or door to turn about a vertical axis, said latch having in its structure a spring actuated reciprocable bolt to engage with a suitable keeper, and to releasably lock the latch against pivotal movement whereby the bolt engaged with the keeper will hold the door snugly closed, yet upon release of the latch, both it and the door may swing about their pivotal axes of mounting and the latch very readily disengage from its keeper. Then when the door is closed, the latch having returned to its original position, the latch bolt is moved inwardly in the act of closing the door until the latch bolt and the keeper recess come into conjunction, whereupon the door is very snugly and firmly held in closed position.

The structure for attaining the objects stated, as well as many others not at this time enumerated, may be understood from the following description, taken in connection with the accompanying drawings, in which,

Fig. 1 is a fragmentary elevation illustrating a refrigerator door mounted upon a refrigerator and equipped with the latch mechanism of our invention.

Fig. 2 is a fragmentary enlarged elevation showing the manner in which the latch is installed upon the inner wood frame of the refrigerator door frame.

Fig. 3 is a fragmentary enlarged vertical section substantially on the plane of line 3—3 of Fig. 2.

Fig. 4 is a view similar to Fig. 3, but more particularly illustrating the manually operated means for releasing the latch.

Fig. 5 is a fragmentary front elevation with the escutcheon cover for the latch release shown in section.

Fig. 6 is a fragmentary section substantially on the plane of line 6—6 of Fig. 2.

Fig. 7 is a plan view of the immediate latching mechanism which engages with the door, with the upper side of the fixed supporting member for the latch mechanism cut away and showing the latch in position to hold the door closed.

Fig. 8 is a view similar to Fig. 7 showing the latch bolt and the supporting carrier therefor freed to swing about a pivot to thereby release the door.

Fig. 9 is a horizontal section through the latch mechanism illustrating the manner in which the longitudinally movable latch bolt is mounted.

Fig. 10 is an elevation from the rear of the immediate latching mechanism, and

Fig. 11 is a similar elevation from the front thereof.

Like reference characters refer to like parts in the different figures of the drawings.

The refrigerator, indicated at 1, is equipped with a door 2 hingedly mounted at one vertical side in the usual manner. The door, as shown in Fig. 6, at its opposite or free vertical edge is provided with a conventional keeper 3 which is made of suitable metal, and contains a recess to receive the latch bolt of the latch which is mounted upon the adjacent portion of the door frame of the refrigerator.

One advantage of the latch mechanism which we have produced is its simplicity and ease of installation upon the interior wood frame of the refrigerator, and before said interior frame has been covered with the metal covering which in practice is given a suitable finish at its outer side in the completed refrigerator. In Fig. 2 the wood parts of the interior structure of the refrigerator are fragmentarily shown and particularly the vertical member 4 at one side of the door frame where it surrounds the door opening. In this wood member 4 a mortice 5 is cut, in which the latch bolt mechanism and the parts which carry the same are located. A vertical slot 6 is cut from the mortice at 5 for mounting a lever which releases the latch bolt carrying mechanism.

All of the latch structure may be readily installed in the mortice 5 and the slot 6 prior to applying the outside metal covering, or only the lever in said slot 6 may be thus installed, and after the outside metal covering has been applied, it is necessary then only to attach the lever operating member which is lightly pressed against in releasing the latch from its locked position so as to free the door for opening. Of course, it is to be understood that while the slot 6 is shown extended upwardly to receive a lever which extends above the latch mechanism, the invention is not limited to the upward extension of the slot 6, as it can be quite as well extended downwardly from the mortice. This may be desirable in many cases as in using the knee to operate the latch releasing member.

The latch structure, which is mounted in the mortice 5 cut in the frame member 4, includes a fixed support of metal bent into substantially U-shape and having spaced apart sides 7 connected at one end by an integral cross member 8. The parts 7 at one edge are continued as outwardly extending ears 9 through which screws are passed to permanently secure the supporting member described to the frame member 4. As shown in Fig. 2, when the latch is mounted in place, the connecting member 8 is presented outwardly and the two sides 7 are in spaced apart parallel horizontal relation extending inwardly into the opening 5.

The support described carries a latch bolt and a mounting for the latch bolt which mounting is pivotally carried on and between the sides 7 of the fixed support described. The latch bolt mounting or carrier is made of two U-shaped members, one having two sides or legs 10 connected by an integral connecting member 11 and with ears extending integrally from the sides 10 through which a pivot pin 12 passes. The connecting part 11, as shown in Fig. 9, has a projection 13 struck outwardly, the purpose of which will later be described. The other member is likewise of substantially U-shape having two sides or legs 14 integrally connected by a connecting member 15 which, at one end, is extended and turned at right angles at 16, the part 16 at its free end passing through and having connection with the part 11. The two members 11 and 15 are in parallel relation to each other making, with the part 16 and the adjacent sides 10, a housing and guide for a latch bolt 17 which has side bars 18 attached thereto and passing freely between the part 16 and the sides 10, and which latch bolt is normally projected outwardly by a compression spring 19 as shown in Fig. 9. It is to be understood that the pivot pin 12 also passes through the free end portions of the sides 14 so that the two U-shaped members described and with the latch bolt mounted thereon in effect provide a unit which swings as a whole about the pivot pin 12. Tongues 20 (Figs. 9 and 11) are struck from the ears 9 previously described and bent into position to limit the swinging movement of the latch bolt carrier or mounting in a counterclockwise direction, in which direction the latch bolt carrier is normally impelled by a light spring 21. Such spring, as shown in Fig. 9, is disposed around the pivot pin 12 and has its free end portions engaging one of the tongues 20 and the latch bolt mounting so as to normally tend to swing the latch bolt and its mounting in a counterclockwise direction until stopped by engaging against the tongue 20.

On a second pivot pin 22 extended between the sides 7 of the permanent or fixed support and between the latch bolt mounting and the part 8 of said support, a dog is mounted for pivotal movement. The dog comprises two spaced apart sides 23 through which the pivot pin 22 passes with a bar 24 integrally connecting the parts 23 at one end. A light spring 25 is associated with such dog, one end engaging the bar 24 (Fig. 9) and the other bearing against the part 8 so as to normally move bar 24 into a position so as to engage the projection 13 on the latch bolt mounting and prevent the latch bolt and its mounting from swinging about the pivot 12. Any swinging movement such as described, will be prevented so long as the bar 24 is in the position shown in Fig. 9, but on turning the parts to the position shown in Fig. 8, the bar 24 is disengaged from projection 13 and the latch bolt and the pivotal mounting therefor may be swung, for example, from the position shown in Fig. 7 to that shown in Fig. 8.

One side 23 of the pivotally mounted dog described at one end is turned at right angles and then back upon itself as indicated at 26 and 27 in Fig. 2, the arm 27 lying at the outer side of the upper leg or side 7 of the fixed support described. The arm 27 terminates in a vertically positioned finger 28. On a suitable fixture 29 secured to frame member 4 and having inwardly extending spaced ears 30, a lever 31 is pivotally mounted between its ends. Said lever lies in the slot 6 and has its lower end turned inwardly at right angles as at 34, (Fig. 2) so as to come within the finger 28 of the arm 27. The other end of the lever 31 is turned outwardly at right angles at 32 passing through a suitable opening cut in the metal cover member 33 which lies over the wood frame member 4 upon which the latch structure is mounted. It is evident that by pressing inwardly on the outer end of the part 32 a movement is given to the member 27, thereby turning the bar 24 from its operative locking position shown in Figs. 7 and 9 to the position where it is inoperative to hold or lock the latch bolt and the mounting which carries the same against swinging movement. As soon as this pressure inwardly on the projecting portion 32 at the end of lever 31 takes place, the door may swing freely open and as it is swung open, it turns the latch bolt carrier or mounting in a clockwise direction, from a position shown in Fig. 7 to that shown in Fig. 8, thereby releasing the door for swinging open to any desired distance. As soon as the door has thus swung open the spring 21 will act to return the parts to the position shown in Figs. 7 and 9, while the spring 25 will act to move the locking bar 24 to its normal locking position as shown in the same figures as soon as release of pressure upon the part 32 occurs.

For operating the lever 31 a flat metal plate 35 with a slot therethrough for passing the outwardly extending portion 32 of lever 31 is attached by screws after the metal cover 33 covering the inner frame structure of the refrigerator has been secured in place. An immediate operating member 36 is pivotally carried at one end by ears 37 projecting from the plate 35, the lower end portion of member 36 coming over the outer end of the part 32. A suitable decorative and attractive design of escutcheon 38 is used to cover the plate 35, and such escutcheon is suitably slotted so that the pivotally mounted operating member 36 may project through the slot. This is indicated in Fig. 4. The lever 31 is therefore operated by pressing inwardly on the lower end of the member 36. The operat-

ing structure shown and described is preferred though it is evident that the specific operating structure is in no sense essential to the invention. In fact, the escutcheon plate 38 and operating member 36 could be readily eliminated and merely a button secured to the outer end of the part 32 used. There are many other specific ways in which the lever 31 could be manually operated.

When the latch is released the door preferably is automatically swung open by means of any suitable mechanism such as a spring actuated plunger indicated in dotted lines at 40 in Fig. 1. Of course, any suitable equivalent could be used such as other spring mechanisms or even spring hinges for mounting the door. The invention is not specifically concerned with any particular means which may be used to automatically open the door.

From the foregoing description it is apparent that we have provided a very novel, durable and economically constructed and installed latch mechanism. With the door closed and with the locking dog, including the bar 24 and the legs 23 engaging against projection 13 and holding the latch bolt against any swinging movement, the door cannot be opened, and the spring pressure of the spring 19 acting upon the bolt 17 holds the door very securely closed. Operating the lever 31 so as to release the locking bar 24 results in the spring actuated plunger 40 throwing the door open and both the door and the latch bolt housing swing about vertical axes. The door swings about the axes of the hinges which mount it, and the latch bolt housing swings about the axis of the pin 12.

The door being open, spring 21 returns the latching bolt and the mounting which carries it to its initial position. When pressure upon the lever 31 is released the locking dog reengages with the projection 13. Then when the door is closed, the keeper bears against the end of the latch bolt 17, compressing the spring 19 until the end of the latch bolt comes into conjunction with the keeper recess whereupon the bolt is projected outwardly into said recess occupying the position shown in Fig. 6 and latching the door against opening until released in the manner previously described. While the operating member for releasing the latch is shown at the upper part of the refrigerator, the lever 31 may be extended downwardly, as previously mentioned, in a suitable slot 6 instead of upwardly as shown, it of course being understood that the latching mechanism will be suitably rearranged so that the end of the lever adjacent the latching mechanism will serve to release or free the locking dog described. The length of the lever 31 is a matter of choice so that the position where the immediate releasing member 36 is to be located is a matter of choice on the part of the designer and builder of refrigerators. The installation is simple and economical as is evident. It is further evident that the major portion of all parts entering into the construction of this latch are covered so that no expensive plating or polishing for the sake of appearance is required. In fact, the only parts which are outwardly exposed are the escutcheon plate 38 and the immediate release operating member 36. Everything else is covered.

The invention is very practical and useful and is particularly durable, economical to make and install and efficient in use and operation.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

We claim:

1. A latch construction comprising, a fixed support, a mounting for a latch bolt pivotally mounted on said support, a spring actuated latch bolt reciprocably carried by said mounting, said latch bolt having an engaged part thereon whereby the mounting therefor is urged to one of its substantially extreme positions, means for releasably locking said mounting against pivotal movement, and means for releasing said locking means to permit the pivotal movement of the mounting and the bolt carried thereby.

2. A latch construction comprising, a support adapted to be secured in fixed position, a mounting pivotally mounted on said support, a latch bolt carried by said mounting and guided therein whereby the latch bolt may be moved back and forth in the direction of its length, spring means normally forcing the latch bolt in one direction, a releasable locking means normally engaged with said mounting to hold it against pivotal movement, said means comprising a projection on the mounting and a pivoted dog on said fixed support engaging with the projection, and means for turning said pivoted dog to release it from said projection on the mounting, thereby freezing said mounting for pivotal movement.

3. In a construction of the class described, a door frame including a vertical frame member, said frame member having a morticed recess therein and a slot extending from said recess in the direction of the length of the frame member, a lever pivotally mounted in said slot, a latch mechanism located and secured in said recess comprising a support, a mounting for a latch bolt pivotally carried by said support, a projection extending from said mounting, a pivotally mounted dog normally engaging the said projection to hold the mounting against pivotal movement, and interengaging means on said lever and dog for turning the dog to free the same from said projection and thus release the latch bolt mounting for pivotal movement.

4. A construction containing the elements in combination defined in claim 3, said lever at the end farthest away from the latch having an outwardly extending projection extending beyond the face of said frame member on which it is carried, whereby said outwardly extending portion may be manually engaged to operate the lever to free the latch bolt mounting for pivotal movement.

5. A latch construction comprising, a supporting member adapted to be fixedly secured in place, said supporting member having spaced apart sides connected at one end, a latch bolt mounting disposed between the sides of said support, a pivot for said mounting carried by the sides of said support, a latch bolt slidably carried by said mounting, a spring normally projecting one end of said latch bolt outwardly beyond the mounting and said support, a projection on the mounting, a dog pivotally mounted on the support having one end adapted to engage said projection to hold the mounting against pivotal movement, and means for moving the dog away from said projection to free the latch bolt mounting for pivotal movement.

6. A construction containing the elements in combination defined in claim 5, combined with a spring on each of the pivots for said mounting and for said dog, said springs normally act-

ing to move the mounting and to move the dog into position such that the dog will engage with said projection on the mounting and hold the same from pivotal movement.

7. A latch comprising, a support adapted to be held in a fixed position, a latch bolt pivotally and reciprocably mounted on said support, reciprocating movement of the latch bolt in one direction tending to cause pivotal movement thereof, means for releasably holding the bolt from pivotal movement and means for releasing said bolt for pivotal movement.

8. A latch construction comprising, a support, a latch bolt, means for mounting the latch bolt for swinging movement from its operative to its inoperative position, a relative light spring urging the latch bolt to its operative position, locking means for locking the latch bolt with respect to its movement relative to said light spring, additional means for mounting the latch bolt for straight line movement to and from its operative position and relatively heavy spring means for urging the latch bolt to its operative position.

9. A combination of elements as set forth in claim 8 in which spring means is provided for urging the locking means into its operative position.

10. A combination of elements as set forth in claim 8 in which the swinging movement of the latch bolt is in a direction outwardly from the closed position of the door to which the construction is attached.

CARL W. GESKE.
ELMER J. ROOSSIEN.